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## **The role of cover crops in varying crop rotations on light soil**

### **Summary**

Cover crops currently perform many pro-environmental issues, and additionally, when reducing the number of livestock, they can be an alternative to the lack or shortage of manure. The aim of the study was to assess the response of selected crops (potato, oats, winter rye) to cultivation in crop rotations with varying percentage of them in the cropping system on light soil as well as to determine the impact of two stubble catch crops on soil conditions and the growth and yield of these crops.

The basis of the research was one-factor field experiment carried out in 2011–2014 at RZD Swojec belonging to the Wrocław University of Environmental and Life Sciences.

Simplifications in crop rotations resulted in more frequent occurrence of take-all diseases, an increase in weed infestation, the deterioration of selected soil properties and a decrease in crop yield.

The scale of changes caused by the implementation of catch crops into the soil (white mustard or a mixture of legume plants) was different and not always unambiguous. It was shown that catch crops positively affected crop yields, and the mixture was better than mustard catch crop. Potato yield after legumes depending on the type of crop rotation and increased from 14.3% to 14.7% in comparison with no catch crops. For oats, the differences were from 8.5 to 15.0%, and for rye from 20.9% to 27.7%.

However, no clear impact of stubble catch crops on the reduction of weed infestation was found although they most often caused the lower number of weeds in the stand. The mixture catch crop proved to be more effective than mustard one. Stubble catch crops, especially mustard one, generally improved plant health status. In addition, these crops, and particularly mixture, improved most of the soil properties, especially the activity of microorganisms, nitrogen and carbon content as well as soil structure indicators.

**Key words:** catch crop, oat, yield, potato, crop rotation, winter rye